

main satellite speaker

DO NOT REMOVE THE SPECIAL ACOUSTIC FOAM ATTACHED TO THE FRONT Baffle AND/OR GRILLE OF YOUR SPEAKERS.

This foam is a critical part of your loudspeaker system and plays an important role in its high level of performance. It focuses the radiation of the tweeters, minimizes cabinet diffraction, and provides the flattest possible frequency response.

operation manual

S-250
S-150THX
S-150THX C
S-150THX AC



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Please record the following information for your records:

Serial Number: _____
 Date of Purchase: _____
 Dealer Name: _____
 Dealer Address: _____
 City/State/Zip: _____
 Country: _____
 Invoice Number: _____

1. INTRODUCTION

Congratulations! Your new M&K THX speaker system will give you years of unmatched enjoyment and excitement while listening to your favorite musical and audio/video sources.

We encourage you to read this owner's manual, as there is a great deal of information provided here to help you get the best possible performance.

If you have any questions about your speaker system, please contact your M&K dealer or call the M&K factory directly at (818) 701-7010, from 8:30 AM to 5:00 PM Pacific Time, Monday through Friday. Alternatively, you can send us an e-mail to support@mksound.com. This manual gives you basic hook-up instructions first, followed by more detailed technical, installation, and service information.

2. THE HOME THX AUDIO SPEAKER SYSTEM

Your choice of an M&K Home THX Audio speaker system assures you of achieving the state of the art in home theatre music and video reproduction. The precise and exacting standards developed by Lucasfilm's Home THX division, as applied by M&K's engineering team, assure that you will hear every element of film sound - from the softest brush of an object against an actor's clothing to the awesome impact of effects such as an exploding planet - with the same sonic quality heard by the film's director and sound designer as they created the final mix of sound on the studio's dubbing stage.

To do this in a home environment requires different equipment and standards than are found in a THX motion picture theatre. The standards developed for Home THX Audio are critically important to achieving the following performance attributes:

- wide frequency range, extending to the limits of audibility
- smooth, naturally balanced overall sound
- excellent dialog intelligibility
- wide dynamic range with extremely low distortion
- well-matched timbre (tonal balance) between front speakers and surrounds
- precise localization of specific sounds (as in special effects)
- envelopment by ambient soundfield (without any localization of individual speakers to distract from the action on-screen)
- superb performance with musical sources

The unsurpassed quality of your M&K Home THX Audio speaker system means that all of the excitement and emotional involvement of films and music will be brought to life in your home. Turn down the lights, and let the experience begin!

3. PLACEMENT OF YOUR M&K SPEAKERS

Your S-150 speakers can be installed in a wide variety of locations. They can be placed on stands, shelves, or bookcases, or more permanently mounted using brackets, direct attachment to the wall, or a ceiling suspension system. We recommend placing the S-250 speaker either on stands or wall brackets, away from side reflective surfaces.

Your speakers have threaded mounting hardware permanently mounted into the cabinet in different locations on the speaker's back baffle. These allow you to mount the speakers in a wide variety of locations, and to orient them for the best possible sound. This hardware is 1/4 - 20, meaning 1/4 inch in diameter, and 20 threads per inch.

There is a four hole mounting pattern on the rear baffle to accommodate either a M&K ST-series wall mount bracket or ST-series component speaker stands.

You can place your speakers virtually anywhere in the room, but certain locations are better than others. In general, locate them away from obstructions that would interfere with the direct path from the speakers to your ears (such as walls, furniture, lighting, plants, etc.). They will sound better when they are around ear height, or when angled towards your favorite listening location. Proper speaker alignment will assure optimal speaker performance.

The S-150 and S-250 speakers are magnetically shielded. This means that they can be placed close to a television monitor without distorting the picture. If you place the speaker directly on top of a large screen direct-view monitor, there is some slight possibility of picture distortion. If that occurs, you may need to move the speaker a few inches or to separate the speaker from the television by a similar distance. Call the factory if you have problems. For more detailed general placement information, see Section 5 and 6.

4. SPEAKER HOOK-UP

The sound quality that you get from your speakers can be affected by the type of speaker wire that you use to connect them. While it is possible to use speaker wire as thin as 22 gauge to hook your speakers, wire of less than 16 gauge will compromise their sound quality. We strongly recommend using the heaviest gauge wire possible. Your special M&K 5-way binding post input terminals will directly accept wire as heavy as 4 gauge!

For wire runs of up to 10 feet, 16 gauge wire is acceptable. For runs up to 20 feet, you should use a minimum of 14 gauge. For up to 30 feet, use a minimum of 12 gauge, and over 30 feet should use 10 gauge.

There are a very wide variety of premium speaker cables available from a number of specialist manufacturers. We do not endorse any specific brand of premium cable, but we do recommend the highest quality cable that fits your budget. Beware, though — with cables, expensive is not always better. If you have any questions, contact your M&K Home THX dealer for advice.

The S-150 and S-250 are not designed for bi-wiring. We do recommend, however, that they be amplified with an M&K Powered Subwoofer.

WIRING

The Positive (+) lead from your amplifier or receiver should be connected to the RED (+) "INPUT" terminal, and the Negative (—) lead from your amplifier or receiver should be connected to the BLACK (—) "INPUT" terminal. See Figure 1.

5. OPTIMIZING SPEAKER PLACEMENT

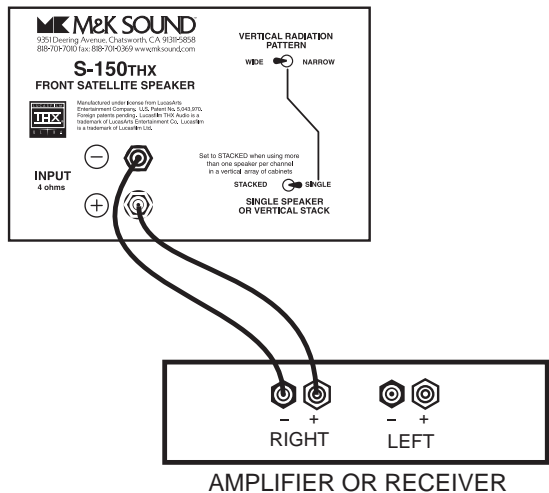
The sound quality produced by your speakers can be significantly enhanced by careful attention to their placement. You will get the maximum return in sound quality for your investment by following these guidelines as closely as possible.

Four factors are important in getting the best sound. They are:

- A. Height or angle (proper orientation of tweeters relative to listeners' ears).
- B. Location away from room walls or reflecting surfaces.
- C. Separation between left and right speakers.
- D. Vertical orientation of the speaker cabinets.

FIGURE 1 - WIRING

(one channel only is shown for clarity)



A. HEIGHT (OR ANGLE)

The S-250, and S-150 have a controlled vertical radiation pattern that makes the speaker's location critical. It is very important to aim the tweeters at the main listening position in order to achieve their very best sound quality and their flat-test frequency response.

Ideally, your speakers' tweeters should be at the same height from the floor as your ears when you are sitting in your main listening position. Specifically, this means the distance from the floor to the center tweeter. If you have the speakers mounted above or below this height, you must tilt the speakers so that the tweeters are aimed at your ears when you are in the main listening position.

If you have the special Angled Center (S-150AC), its front baffle has a built-in "tilt" that aims the sound either up or down depending on orientation. This speaker is ideal for use as the center channel speaker sitting on top of a rear-projection television set.

You can start by aligning the speakers visually. Sit in your main listening position and look at the cabinets' tops and bottoms. When their perspective is about the same relative to where you are sitting (about the same angle), you are at least very close to the proper alignment.

The best way to determine the proper angle is to have a helper move the speakers while you sit and listen. You should be able to hear the difference when the speakers are in the best location by listening for the brightest high frequencies and for the best "focus" of sound, where you hear the sharpest sonic imaging of voices and instruments. To aim the speakers more precisely, we recommend using a laser alignment tool. One can be purchased from M&K, simply visit our web site or call M&K directly.

B. LOCATION AWAY FROM REFLECTING SURFACES

Your speakers should generally be located away from walls, furniture, or any other reflecting surfaces. Any object located close to the speaker will reflect the sound radiated from the speaker to your ear with a slight time delay compared to the direct sound reaching your ear. This time delay will blur the sonic imaging and interfere with transient performance.

The delay is very slight, so instead of hearing an echo, you hear a "blurred" sound with less clarity that is not as sharp and distinct as it should be. This time delay also affects frequency response and sonic imaging.

If the speakers will be sitting on shelves, locate them on the front edge of the shelf, so there is no flat surface directly in front of them. If any speaker will sit close to a wall or any other large object, leave as much space as possible between the speaker and the object. Ideally, your speakers will be located away from the nearest surface, but in most rooms compromise will be necessary.

SPECIAL NOTE: For the S-250, locate the speakers away from reflecting surfaces near to the sides of the speaker cabinet. This includes side walls, the sides of entertainment centers, other furniture, etc. The S-250 will sound and perform at its optimum level when mounted to M&K speaker stands and located out in the room.

C. SEPARATION BETWEEN LEFT AND RIGHT SPEAKERS

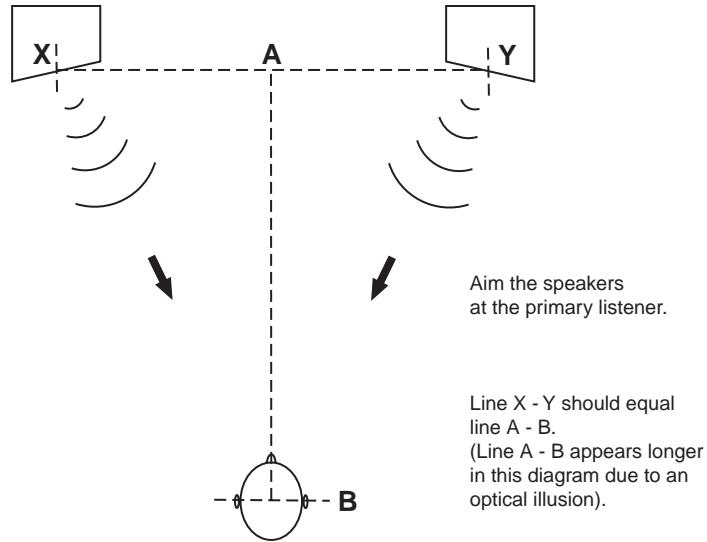
Here is a formula for achieving the ideal left to right stereo imaging. Think of a triangle formed by the locations of the left and right speakers and your listening position. Ideally, the subtended angle formed should be between 45 and 50 degrees. Roughly, this means that the left and right speakers should be separated by about the same distance that you are sitting back from the speakers. In other words, if the distance from your listening position to the point directly between the speakers is 10 feet, place the speakers so their centers are about 10 feet apart. See Figure 2.

The length of line A - B should be about the same as the length of line X - Y. (They may not seem to be the same in this diagram due to an optical illusion).

Try to follow the formula as close as you can. You can fine tune the placement by listening to a source with an image (such as a vocalist) centered between the speakers. When listening in stereo (no Center Channel speaker), move the speakers closer together or farther apart in small increments until you hear the sharpest and most cohesive image, espe-

FIGURE 2

SEPARATION BETWEEN LEFT AND RIGHT SPEAKERS



cially in the phantom center. You may also want to angle (or "toe-in") the speakers slightly. This often improves the sharpness of the stereo image, and provides a wider seating area. The S-150 Left and Right speakers provide a default toe-in through the angle of their front baffles.

D. VERTICAL ORIENTATION

The performance of your speakers is dependent on their orientation. THX speakers are designed for controlled vertical dispersion and wide horizontal dispersion. By controlling the vertical dispersion, we limit the amount of sound that would otherwise be reflected with a time delay from the floor and ceiling (for the reasons discussed in B. above).

This means the speakers should always be vertically oriented. The S-150 is vertically oriented when its tweeters are vertically stacked (not next to each other). When vertical, the controlled dispersion is in the correct plane. If they are oriented horizontally (on their sides), listeners right or left of a direct line from the center of the speaker will hear a compromised sound quality, an irregular frequency response, as well as some other problems.

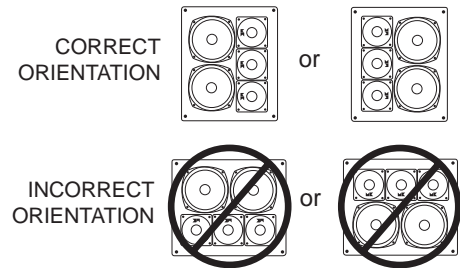


FIGURE 3

While this may be acceptable for background listening, we strongly recommend that you do not place them on their sides for any other listening. **The S-250 and S-150 must be oriented vertically (tweeters in a vertical line). See Figure 3.**

6. SPEAKER PLACEMENT IN A HOME AUDIO SYSTEM

Placement is very important. You should take at least the same amount of time and care in setting up your M&K speakers as you would with the most exotic high-end stereo system. Some listeners make the mistake of taking too casual an approach to the installation of speakers in a home theatre system. In fact, in many ways the setup of speakers in a home theatre is more critical than for stereo.

Even though the S-250 and S-150 are less influenced by the room environment than most other speakers, the time you spend in carefully installing them will significantly enhance your enjoyment of them later.

The Left, Center and Right speakers should ideally all be at the same height as the television screen. Because the Center channel speaker cannot cover the screen, it will have to be placed above or below the screen. Try to set up all three speakers at the same height. If this is not practical, set them up so that they are no further apart vertically than the speakers' two (2) foot height. In other words, the bottom of the speaker the farthest from the floor should be no higher than the top of the speaker closest to the floor. See Figure 4.

Remember that the speakers need to be aimed at the listening position when they are not placed with the tweeters at the same height as the listeners' ears. Your speakers have great flexibility in combination with stands, mounting brack-

ets, or speaker hangers to make this easy to accomplish. Remember that they are designed to be installed vertically, with the tweeters aimed at the listeners' ears.

They can, however, be placed at virtually any height. This includes sitting directly on the floor, tilted up, as well as being mounted at ceiling height and tilted down. For certain installations, where the speaker is located above the listener's ear level, the use of the S-150AC is a good alternative. See Figure 5. You may use three identical (S-150AC) speakers for all three front main channels, if required. See Figure 6. Just remember that all three speakers should be at the same height or as close to the same height as possible.

FIGURE 4

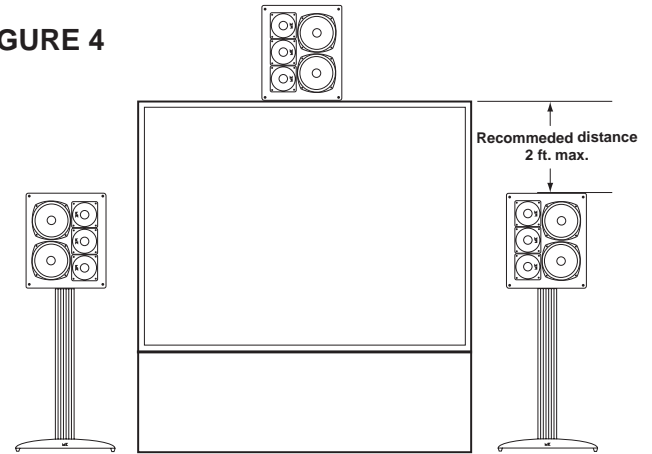


FIGURE 5

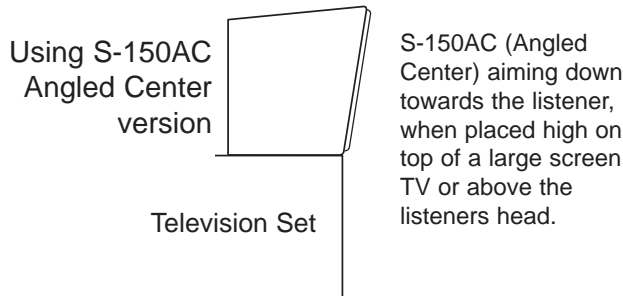
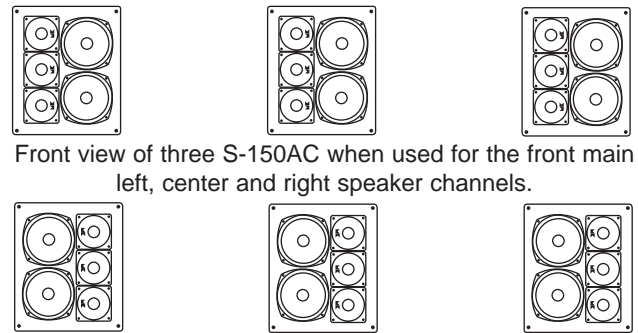


FIGURE 6



If desired, a slight toe-in of the Left and Right speakers will improve the sound quality for listeners away from the center position, and can often improve imaging and overall sound quality by reducing the amount of side wall reflections reaching all listeners' ears. The S-150 Left and Right speakers give you a built-in toe-in through their angled front-baffle design.

7. SPECIAL CONTROL SWITCHES FOR S-150THX

A. Vertical Radiation Pattern (Narrow / Wide):

Your satellite speakers have a special feature developed for professional studio use. This feature allows you to vary the vertical radiation pattern to fit your system needs or your personal preference. The "Narrow" position conforms with the THX Ultra standard.

After final aiming of the loudspeaker system has been completed, smooth high frequency coverage should be confirmed throughout the listening area. When using the S-150thx near a mixing console or other reflective surface, it is preferable to set the S-150thx in its Narrow Mode. In the narrow mode the S-150thx will minimize floor, console and ceiling reflections, providing smoother horizontal on and off axis frequency response.

When multiple rows of seats need to be covered, or the monitoring area is larger than the Narrow Mode will cover, it is recommended that the S-150thx be used in its Wide Mode. This mode widens the vertical coverage angle, but also makes the speaker more susceptible to room boundary interference. Determining which mode best suites your monitoring condition might require some experimentation or evaluation through careful listening tests.

B. Stacked / Single:

This switch allows you to stack more than one speaker to create a vertical array, either for higher output levels, or for use in very large rooms. Setting this switch to the "Stacked" position will bypass the Narrow/Wide function.

To do this, simply place one speaker on top of the other, with the tweeters aligned in a vertical stack. Then set the "stacked/single" switch to the "stacked" position.



8. SATELLITE/SUBWOOFER PHASING TEST

In any system using a subwoofer separate from Satellite speakers, a phasing test must be performed to insure good bass blending. This test insures optimum sound in the critical bass frequencies where your Subwoofer and Satellite speakers overlap.

HOME THX AUDIO SYSTEM

For a Home THX Audio system, follow the system instructions provided with the THX controller, as you will need to have correct phase among all the speakers in the system. These instructions will take you through the front channels, surround channels, and subwoofer.

SATELLITE/SUBWOOFER SYSTEM

If you own an M&K Powered Subwoofer, see its owner's manual for the correct procedure for matching phase between the Satellites and Subwoofer. Its "SUBWOOFER PHASE" switch makes this important test very easy. If your subwoofer does not have a "SUBWOOFER PHASE" switch, follow this procedure:

Play a familiar CD, LP, or tape with steady, consistent bass content through your system. Listen carefully to the "mid-bass" region of 75 - 125 Hz. This is the part of the spectrum where electric or string basses and drums predominate. Then, reverse the Positive and Negative speaker inputs on the back of BOTH Satellite speakers.

You can do this at the back of both Satellite speakers, or at the Subwoofer's "TO SPEAKERS" terminals (certain models only), but never at both locations. The lead that was on the Positive (+) terminal should be switched to the Negative (—) terminal, and vice versa.

Now listen to the same musical passage as you did earlier, concentrating on the mid-bass region. If you hear less bass, the original connections were correct. If you hear more bass, the new connections are correct.

You need to perform this test because when Satellite speakers are located separate from a Subwoofer, each speaker is at a different distance from your ear. In some cases, the difference will be just enough so that the output from the Subwoofer arrives out of phase with the output of the Satellites. When this happens, that critical mid-bass is actually cancelled. You should re-do this test any time you move your speakers.

If you want to experiment further, you can move the Satellite speakers either towards or away from your listening position, making changes in small increments. This will "focus" the system's sound to its optimum. When you hear the best balance between stereo image localization and maximum impact and output in the mid-bass, you have the ideal location.

9. SPEAKER DAMAGE & HOW TO AVOID IT

An important factor to consider with any loudspeaker system is the potential for speaker damage. Even though your speakers have extremely high power handling ability, they still can be damaged by relatively low powered amplifiers.

While very few M&K Satellites are actually returned for service, the vast majority of those returned are not for manufacturing defects. Instead, they are returned because they have been overdriven, almost always because the amplifier or receiver used was driven into clipping distortion. This damage is considered abuse, and is not necessarily covered under warranty.

This clipping distortion occurs when the demands of the music are greater than the amplifier's available power. It can occur at 20 watts with a small amplifier, or at 400 watts with a large amplifier. Regardless, when this happens, the amplifier's output waveform (which usually looks like a smooth arc) is "clipped" off, exhibiting a flat top instead of the arc.

This flat top contains multiples of the original amplified frequencies, sometimes at higher levels than the original signal itself. For tweeters, this can be very damaging, as this distortion is well above the audible range, where you will be unable to hear it, and where the tweeter is more vulnerable to damage.

When an amplifier clips, its sound becomes harsh and grating, and a break-up is often audible in the bass frequencies. It will become uncomfortable to listen to, compared to a slightly lower volume level. When you are listening at high volume levels, be aware of the onset of clipping distortion, and turn the volume down slightly if the sound takes on the character described above.

When tone controls or equalizers are used to boost frequencies, the problem occurs much more rapidly. Even a small boost of low or high frequencies can easily double the power requirement and lead to amplifier clipping at moderate levels. Therefore, you should use your tone controls judiciously, avoiding extreme boosts of the bass and treble controls, especially when you are listening at high volume levels.

The best way to avoid speaker damage is to use common sense. Use moderate boosts of tone controls or equalizers, at the very most. Listen carefully for any harshness and break-up, especially at high volume levels, and turn down the volume when needed. If you cannot get enough volume, you may need to consider a higher-powered amplifier. If you have any questions about this, please contact M&K or your local M&K dealer.

10. M&K WALL MOUNT BRACKET AND STAND OPTIONS

We recommend using M&K's ST series of floor mount stands for your S-250 or S-150 speaker. See Figure 7. These stands are comprised of several components. For each stand assembly, you will need the base, the leg/pipe, the leg/pipe cover, and the bracket. For additional flexibility, you may choose to have the pipe custom made to suit your specific application.

The use of M&K's ST-series component stand will allow both vertical and horizontal alignment. Making the critical speaker alignment process both accurate and simple. Additionally, for even more precise aiming of the speakers, we recommend using a laser alignment too. This laser too can be ordered direct from M&K, just visit our web site for more information and ordering instructions.

If using speaker stands is not ideal for your particular application, M&K also offers ST-Wall brackets, for the greatest flexibility in mounting your S-150 and S-250 speakers to the wall. The ST-Wall/Tilt brackets can be adjusted vertically and horizontally. The ST-Wall/Fixed brackets can only be adjusted horizontally. Versions designed for corner mounting, known as the ST-Corner/Tilt and ST-Corner/Fixed is also available. See Figure 8.

DO NOT MOUNT THE SPEAKER TO THE SHEET ROCK OR DRY WALL USING WALL ANCHORS. ALWAYS MOUNT THE SPEAKER TO A STUD.

If you have any questions or concerns about mounting the speaker, please contact your local M&K dealer or M&K directly.

For more information on M&K's full line of brackets and accessories, visit our web site (www.mksound.com) or see our "Installation Solutions Catalog".

11. IF YOU NEED SERVICE

Contact your dealer or M&K with a complete description of the problem. Please have the unit's model and serial numbers (found on the back of the cabinet), date of purchase, and your dealer's name. You can call M&K between 8:30 AM and 5:00 PM Pacific Time, Monday through Friday, at (818) 701-7010. If you call outside these hours, leave a message, and we will return your call or you can e-mail us at service@mksound.com.

DO NOT RETURN YOUR SPEAKERS TO THE FACTORY FOR SERVICE WITHOUT OBTAINING PRIOR AUTHORIZATION

All M&K Satellite speakers carry a ten year limited parts and labor warranty. This warranty is transferable to new owners up to three years from the date of original purchase, and it includes Subwoofer amplifiers. It does not cover abuse, misuse, repairs by unauthorized service stations, speakers without serial numbers, and those damaged in shipping or by accident. If you have any questions about the warranty, please contact M&K Sound or your local M&K dealer.

FIGURE 7

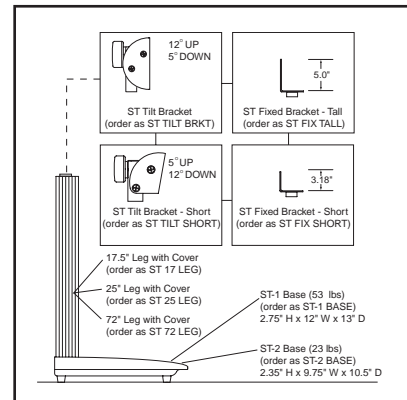
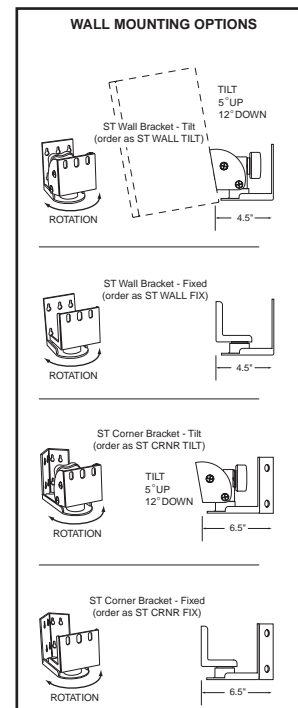


FIGURE 8





12. CABINET MAINTENANCE

The S-150's and S-250's painted black finish does not require any special maintenance; regular dusting with a lint-free cloth and periodic cleaning is all that is required. Matching black paint can be used if necessary to repair any surface damage.

13. SPECIFICATIONS

S-250

IMPEDANCE:	4 ohms
MINIMUM POWER:	25 watts RMS
RECOMMENDED POWER:	amplifiers with between 50 and 400 watts RMS or more (see below)
MAXIMUM POWER:	400 watts RMS unclipped peaks
FREQUENCY RESPONSE:	72 Hz - 20 KHz \pm 2
DIMENSIONS (H x W x D):	12 1/4" x 10 1/2" x 14"
WEIGHT:	29 lbs
RECOMMENDED STANDS:	M&K ST-1 Base, ST-Leg/Tilt17 or ST-Leg/Tilt25
BRACKETS:	M&K ST-series wall brackets

S-150THX

IMPEDANCE:	4 ohms
MINIMUM POWER:	25 watts RMS
RECOMMENDED POWER:	amplifiers with between 50 and 400 watts RMS or more (see below)
MAXIMUM POWER:	400 watts RMS unclipped peaks
FREQUENCY RESPONSE:	77 Hz - 20 KHz \pm 2
DIMENSIONS (H x W x D):	12-1/2" x 10 7/8" x 12 1/2" Angled Center Channel speaker: 12 3/8" x 10 1/2" x 12 1/2"
WEIGHT:	21 lbs
RECOMMENDED STANDS:	M&K ST-1 Base, ST-Leg/Tilt17 or ST-Leg/Tilt25
BRACKETS:	M&K ST-series wall brackets